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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/565,433

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Gaetano Guerra

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NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER

NEGRELLI, KARA B

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

05/14/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/565,433	Applicant(s) GUERRA ET AL.	
	Examiner KARA NEGRELLI	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 8-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>01/20/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

NANOPOROUS AND MICROPOROUS MANUFACTS BASED ON SYNDIOTACTIC

POLYSTYRENE AND PROCESSES FOR THEIR PREPARATION

DETAILED ACTION

Election/Restriction

1. Applicant's election with traverse of claims 1-17 and 15-17 in the reply filed on May 4, 2009 is acknowledged. The traversal is on the ground(s) that there is no serious burden on the office to examine the inventions together and because Groups I and IV are related as combination-subcombination. This is not persuasive because the instant application was filed under 35 U.S.C. 371 and unity invention is present. Furthermore, restriction practice for applications entering the National Stage under 35 U.S.C. 371 is covered under MPEP Chapter 1800 (MPEP 801) which is governed by the unity of invention and does not require the consideration of serious burden of searching (MPEP 1893.03(d)).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Guerra et al. (IT 1306004). Please refer to the English translation which is included in this action.

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4. Guerra et al. teach a process for obtaining nanoporous semicrystalline materials from syndiotactic polystyrene in which the definition of syndiotactic polystyrene includes styrene copolymers with a prevalently syndiotactic microstructure that can be crystallized into the nanoporous crystalline form with $\text{CH}_2=\text{CH-R}$ olefins, wherein R is an alkyl-aryl or a substituted-aryl radical with 6-20 carbon atoms or with other copolymerizable ethylenically unsaturated monomers (See translation, page 2, lines 1-11). The syndiotactic polystyrene, in the form of a powder, contains 15% by weight of styrene, and this powder is combined with 15% by weight toluene (a solvent) (See Example 2, page 6 of the translation). Guerra et al. further teach extraction with carbon dioxide, either liquid or under supercritical conditions, and preferably the extraction conditions are such that $30^\circ\text{C} < T < 70^\circ\text{C}$ and $70 \text{ bar} < P < 150 \text{ bar}$ (See translation, page 4, line 21- page 5, line 2 and Examples 1 and 2, pages 5 and 6, respectively). Particular examples are removal of the solvent using carbon dioxide under supercritical conditions at a temperature of 40°C and a pressure of 200 bar (See Examples 1 and 2, pages 5 and 6 of the translation, respectively).

5. One of ordinary skill would recognize that dissolving a powder in the amount of solvent disclosed by Guerra et al. (IT 1,306,004) would result in the formation of a gel. The specification of the instant invention teaches dissolving a syndiotactic polymer in 10 wt. % of solvent, which forms a physical gel (paragraph [0042]). Therefore, the material disclosed in Guerra et al. (IT 1,306,004) anticipates instant claim 1.

6. Guerra et al. (IT 1,306,004) do not expressly teach that the nanoporous material has an apparent density of $0.001 - 0.8 \text{ g/cm}^3$ and a percentage of crystallinity between

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5-70%. However, since the nanoporous polymeric material taught in Guerra et al. (IT 1,306,004) was prepared in an identical method as that disclosed in instant claim 1, one of ordinary skill in the art would expect that the nanoporous polymeric material taught in IT 1,306,004 would have the same properties disclosed in instant claim 1. Case law holds that a material and its properties are inseparable. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

7. Guerra et al. (IT 1,306,004) does not expressly teach that the composition formed does not contain chemical crosslinking. However, since no crosslinking agent is used or described, one of ordinary skill in the art would recognize that the composition would not contain chemical crosslinking.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guerra et al. (IT 1,306,004) and further in view of Mertens et al. (US 2,418,978).

10. Guerra et al. teach the composition as applied to claim 1 but fail to teach that the composition is characterized by chemical crosslinking and that the chemical gel is prepared using an at least bifunctional monomer (instant claim 5) in an amount of from 0.1 to 20 mol % (instant claim 6) or an amount less than 10 mol % (instant claim 7).

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11. However, Mertens et al. teach a composition comprising 75 parts by weight of polystyrene mixed with 25 parts by weight of a mixture consisting of styrene and 1% paravinylbenzol (divinylbenzene) whereby swelling is effected (a gel is formed) and the mixture is polymerized (column 2, lines 45-50). 1% of 25 parts by weight is equivalent to 0.25% paradivinylbenzol. Mertens et al. teach that a shaped body may be produced in a soft state (gel) and may then be hardened (if desired) only by the application of heat (column 2, lines 31-42).

12. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use paravinylbenzol as taught by Mertens et al. in the nanoporous material of Guerra et al. (IT 1,306,004) because the divinylbenzol-containing polymers of Mertens et al. are more resistant to heat, and insoluble and often only capable of swelling (forming a gel) in solvents such as hydrocarbons like benzol (benzene), toluene, or xylene (column 2, lines 5-13). A further advantage of forming polymeric materials using divinylbenzol as taught in Mertens et al. is that the products do not age, or not to a greater degree than the starting materials, and need not contain fillers, vulcanization accelerators, or the like (column 2, lines 19-25).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARA NEGRELLI whose telephone number is (571)270-7338. The examiner can normally be reached on Monday through Friday 8:00 am EST to 5:00 pm EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571)272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KARA NEGRELLI/
Examiner, Art Unit 1796

/Randy Gulakowski/
Supervisory Patent Examiner, Art Unit 1796